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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/726,852

11/30/2000

Robert A. Cochran

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11/17/2005

HEWLETT-PACKARD COMPANY

Intellectual Property Administration

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EXAMINER

POLTORAK, PIOTR

ART UNIT

PAPER NUMBER

2134

DATE MAILED: 11/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/726,852

Applicant(s)

COCHRAN ET AL.

Examiner

Peter Poltorak

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 August 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☒ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

1. In view of applicant remarks in the Appeal Brief filed on 8/01/05, PROSECUTION IS  
HEREBY REOPENED.

To avoid abandonment of the application, appellant must exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37 CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have been increased since they were previously paid, then appellant must pay the difference between the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing below:

A handwritten signature in black ink, appearing to be 'DM', is written over the text 'signing below:'.

2. Claims 1-10 have been examined.

***Drawings***

3. The drawings are objected to because Fig. 1 refers to prior art (a standard disk drive, the specification pg. 1 lines 18-30). However Fig. 1 is not labeled as prior art. Similarly, Fig. 2 is not labeled as prior art even though Fig. 2 discloses the architecture of a typical disk array.

4. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter that applicant regards as the invention.

6. Claim 1 recites: “providing an access table that includes entries that each represents authorization of a particular remote entity to access a particular **logical unit**... when a remote entity requests execution of an operation ... involving one or more additional specified logical units, authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified **control device logical unit**”.
7. For each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.
8. Furthermore dependent claim 3 recites: “the access table includes entries each comprising: an indication of **a logical unit OR control device logical unit**”.
9. It is not clear whether there is a mistake and that authorization of the remote entity to access the specified logical unit should be stated twice rather than the second time being replaced with the control device logical unit. Secondly claim 3 suggests that either indication of a logical unit or a control device logical unit is present in the access table. The authorization of an entity to a logical unit or to control a device logical unit would certainly indicate a logical unit (LUN) or a control device logical unit (CDLUN) respectively and as a result claim 3 seems to contradict claim 1.
10. Applicant does not provide any figures to clarify the issue. The specification seems only to suggest that authorization is achieved by checking for a unique identifier of

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the remote entity (computer) and a logical unit entry in the access table (pg. 8 lines 1-12).

11. Claims 2, 4-5, 7 and 9-10 are rejected by virtue of their dependence.

12. For purposes of further examination claims are treated as best understood.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 1-10 are rejected under 35 U.S.C. 102(e) as being anticipated by Ito et al.

(U.S. Patent No. 6684209).

14. As per claims 1-3 Ito et al. teach a storage subsystem 101 with ports 102-104 communicating with host computers 105-107 that have ports 108-112 (*col. 8 lines 47-58 and Fig. 1*).

15. Furthermore, Ito et al. a "LUN Access Management Table", which includes the linkage information combining a LUN (Logical Unit Number) to identify a LUN that exists in the storage subsystem, the WWN (N\_PortName) allocated to the host computer which may access the LUN, and the Virtual LUN to decide how to show the LUN to the host computer using the input unit 125 within the maintenance terminal."

16. This reads on an access table that includes entries that each represents authorization of a particular remote entity to access a particular logical unit and a

supplemental access table that includes entries that each represents authorization of a particular control device logical unit to access a particular logical unit.

17. Ito et al. teach that this Virtual LUN in this table is disclosed to each host computer.

The WWN of each host computer is known.

The storage subsystem searches the "LUN Access Management Table" using the WWN obtained as a key and obtains the Virtual LUN corresponding to the LUN that is a target of the Inquiry Command from the "LUN Access Management Table". The reason why the storage subsystem obtains the LUN that is a target of the Inquiry Command as a Virtual LUN is that only the Virtual LUN is disclosed to the host computer.

18. Next, when the storage subsystem finds that the Virtual LUN corresponding to the WWN is actually obtained, i.e. the Virtual LUN corresponding to the WWN does exist in the "LUN Access Management Table", the host computer is permitted to access the Virtual LUN. When the required Virtual LUN doesn't exist in the Table, the host computer is refused access to the LUN.

19. This reads on authorizing the request for execution of the operation only when an entry currently exists in the access table that represents authorization of the remote entity to access the specified control device logical unit and, for each of the one or more additional specified logical units, an entry exists in the supplemental access table that represents authorization of the specified control device logical unit to access the additional specified logical unit.

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20. As per claims 2 and 7, col. 14 lines 5-60 clearly show that authorization steps are conducted by a storage subsystem entity.

21. As per claims 5 and 10 Ito et al. teach that the present invention implements a disk array subsystem (col. 15 lines 38-40).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 1- 2 and 4, 6-7 and 9 are rejected under 35 U.S.C. 103(a) as obvious over Tulloch (Mitch Tulloch, "Administering Internet Information Server 4", New York McGraw-Hill Professional, 1998, ISBN: 0072128232) in view of Microsoft Press (Microsoft Press, "Microsoft Windows NT Server, Resource Guide", 1996, ISBN: 1-57231-344-7).

23. As per claims 1-2 and 4, in his book "Administering Internet Information Server 4" Tulloch teaches that Internet Information Server (IIS) is implemented on a computer utilizing mass storage device (hard drives, Tulloch pg. 37).

24. Furthermore Tulloch teaches a remote entity (client) accessing content (e.g. video clips, images applets etc., pg. 81). One skilled in the art would recognize that the content is stored on the mass storage device since the mass storage device (e.g. disk drives) implementing Windows NT environment inherently uses files and



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directories to store data presented to clients (the examiner refers applicant to any Windows NT or any other operating system reference or any computer implementing a file system in Microsoft other Operating System).

25. As well known in the art, files and directories are not real electronic data (physical data) but rather they are abstract (logical) data storage resources that include a defined amount of electronic physical storage space, mapped to the data storage space of one or more disk drives.

26. As a result, files and directories in Windows NT are consistent with applicant's definition of Logical Units (LUN). (See, the specifications, pg. 3 lines 16-24:

"Electronic data is stored within a disk array at specific addressable locations.

Because a disk array may contain many different individual disk drives, the address space represented by a disk array is immense, generally many thousands of gigabytes. The overall address space is normally partitioned among a number of abstract data storage resources called logical units ("LUNs"). A LUN includes a defined amount of electronic data storage space, mapped to the data storage space of one or more disk drives within the disk array, and may be associated with various logical parameters including access privileges, backup frequencies, and mirror coordination with one or more LUNs".)

27. On pg. 133 ("NTFS permissions" section) Tulloch teaches to "control access by clients to physical directories ... based on NTFS access permission for the resource". Using an access table to control access by clients to physical directories

is well known in the art and Tulloch provides an example of such a table (Tulloch, pg. 152 Table 4-2 and pg. 153 Fig. 4-14).

28. As per the limitation "providing a supplemental access table that includes entries that each represent authorization of a particular control device logical unit to access a particular logical unit" the examiner did not find any specific example of such a table disclosed by applicant.

29. However, the specification suggests that the supplemental access table is a table that contains CDLUN with correlating LUN entries and that authorization should be read as checking whether the supplemental access table contains LUN with correlating CDLUN entries (The specification, pg. 8 lines 1-19: "First, the disk array controller determines whether there is an entry in a first access table having indications of a LUN, port, and remote computer identifier equal to the specified target CDLUN of the request, the port through which the request was received, and the unique identifier of the remote computer from which the request was received. When such an entry is present in the first access table, then the disk array controller assumes that the requesting remote computer is authorized to access the target CDLUN. Next, the disk array controller checks a second, supplemental access table to determine if, for each additional LUN specified as part of the request for execution of the operation, there exists an entry containing an indication of the additional LUN paired with an indication of the specified target CDLUN for the operation. Only when the disk array controller finds such an entry in the supplemental access table for each additional LUN specified in the request for execution of the operation does the

disk array controller authorize execution of the operation."). The disclosure of the authorization as discussed above is consistent with the authorization function expressed in the pseudocode on pg. 25 lines 10-30.

30. Tulloch teaches control device logical units (CDLUNs: virtual servers, pg. 164 § 1 "Internet Information Server 4.0 allows administrators to organize Web content ... by using ... virtual servers") and shows the process of setting up the CDLUNs (Tulloch, pg. 177-179), that clearly discloses that the CDLUNs are essentially access points to accessing LUNs (mapping virtual server to servers' directory, Tulloch, Fig. 5-9 pg. 179, "Summary" pg. 186 and "Possible Solution", pg. 183).

31. Also, disk arrays are well known in the art (e.g. Microsoft Press, pg. 73 § 8) and although Tulloch does not explicitly teach using disk arrays it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to use disk arrays in the server as taught by Tulloch given the benefit of disk fault-tolerance. As a result operation of accessing LUNs through CDLUN is carried out by a disk array controller since accessing data stored on disk arrays inherently requires the use of array disk controllers.

32. Tulloch does not explicitly teach providing a supplemental access table that includes entries that each represent authorization of a particular remote client to access a particular logical unit.

33. However, as indicated above, in process of a CDLUN set up one "maps" the CDLUN to a LUN and thus it is clear that correlation of CDLUN and LUN must be kept in some memory storage by the computer (otherwise there would be no need to

explicitly correlate these two entities). Also, it is are old, well-known and widely used in the art of computing to utilize tables to store related information (e.g. Tulloch, pg. 152 Table 4-2). Thus, even though Tulloch does not explicitly teach a supplemental access table it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to keep information comprising CDLUNs with correlating LUNs in a table given the benefit of quick and easy access to related data.

34. Tulloch also does not explicitly teach authorizing the request for execution of the operation only when an entry currently exists in the access table and in the supplemental access table when a remote entity requests execution of an operation directed to a specified CDLUN and involving one or more additional specified logical unit.

35. However, these limitations are implicit. As noted above virtual servers map server's content to URLs (Tulloch, "Summary, pg. 186) and clients access internet content using URLs. As a result, a request from the client for a URL content must be resolved to the (Internet Information) server's directory requiring checking supplemental table entries to map a CDLUN to the appropriate LUN in order to resolve the request. In addition, proper authorization of the requester to LUN must be ensured and this information is found in the access table.

36. Summarizing, the request from the client can only be carried out if there is a LUN (some real data: files and directories) correlated to the requested CDLUN and if the client is granted a proper access to the LUN.

37. As per claim 2, as mentioned above execution of a request must be carried out by a controller (e.g. disk drive controller) within the mass storage device. Also, it is well-known in the art that computer network communication involves use of ports on the client as well as on the server's site. Tulloch clearly discloses this fact configuring the CDLUN (the virtual server) in Fig. 5-13 with a TCP Port 80 (the examiner also refers applicant to pg. 81 and pg. 152 that discusses use of ports).
38. As per claim 4 the supplemental access table comprising an indication of a CDLUN and a LUN was discussed above.
39. Claims 6-7 and 9 are substantially equivalent to claims 1-2 and 4; therefore claims 6-7 and 9 are similarly rejected.
40. As per claim 3 Tulloch teaches an access table that includes entries that each represents authorization of a particular remote entity to access a particular LUN as discussed above. In addition, as discussed above, remote entities access LUN through CDLUN and ports that are mapped to a correlated LUN. This reads on the access table including an indication of a LUN or CDLUN, an indication of a port and an indication of a remote entity.
41. As per claim 5 Tulloch does not explicitly teach that the mass storage device is a disk array and remote entities are remote computers interconnected with the disk array via a communications medium. Microsoft Press explicitly teaches that a mass storage device is implemented using hard disks. (Microsoft Press, pg. 73 § 8) and that disk array provides fault-tolerant disk configuration (Microsoft Press, pg. 155

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§7). Therefore it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to use the disk array to minimize risk of data loss.

42. Claims 8 and 10 are substantially equivalent to claims 3 and 5; therefore claims 8 and 10 are similarly rejected.

### ***Conclusion***

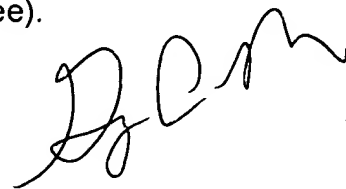
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Poltorak whose telephone number is (571) 272-3840. The examiner can normally be reached Monday through Thursday from 9:00 a.m. to 4:00 p.m. and alternate Fridays from 9:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Morse can be reached on (571) 272-3838. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



11/13/05



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